



RECEIVED
JUL 25 2003
TC 1700

Docket No. 50184

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT(S): Mori et al.

EXAMINER: J. Chu

U.S.S.N.: 08/726,613

GROUP: 1752

FILED: October 7, 1996

FOR: DYED PHOTORESISTS AND METHODS AND ARTICLES OF
MANUFACTURE COMPRISING SAME

Commissioner of Patents
P.O. Box 1450
Arlington, VA 22313-1450

DECLARATION UNDER 37 CFR 1.131

The undersigned declare as follows:

1. We are co-inventors of the above-identified application ("the application") assigned to the Shipley Company.

2. Prior to June 1996, we had conceived of, made and lithographically processed photoresist compositions that contained a photoacid generator, a resin binder and a polymer dyes that contained one or more polycyclic chromophores that could reduce undesired reflections of exposure radiation. We found that preferred chromophores were those that contained carbocyclic or heterocyclic polycyclic moieties, such as anthracene. We also found that preferred dye compounds were polymeric.

Mori et al.
U.S.S.N. 08/726,613
Page 2

3. Prior to June 1996, one or more of us had coated such photoresist compositions onto substrates, particularly microelectronic (silicon) wafers, exposed the applied photoresist layers to activating radiation particularly radiation having a wavelength of 248 nm, and then the latent imaged formed in those photoresist layers were developed to provide a photoresist relief image by treating the exposed resist layers with an alkaline aqueous developer solution. As evidence thereof, attached as Exhibits 1 and 2 are true copies with dates deleted of notebook records of one of us. The disclosure attached as Exhibits 1 and 2 was generated, and actual experimental work disclosed therein was performed, prior to June 1996. Exhibit 1 shows that photoresists with dye compounds were prepared to test lithography. As shown in Exhibit 1, the prepared photoresists included a resin that was a copolymer of vinylphenol and t-butylacrylate (Poly-E), an onium salt photoacid generator of di-t-butylphenyliodonium camphorsulfonate, a basic stabilizer of a lactate salt of tetrabutyl ammonium hydroxide, solvent of ethyl lactate and a dye compound. The dye compounds of the prepared photoresists included ANTMA/HEMA which was a copolymer of methylanthracene methacrylate and hydroxyethyl methacrylate having a molecular weight in excess of 5,000 as disclosed in Example 1 of the application. Exhibit 2 shows lithography results of such photoresists with specified dye compounds, including a photoresist containing having the dye compound of an ANTMA/HEMA polymer.

Mori et al.
U.S.S.N. 08/726,613
Page 3

4. We hereby further declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, and that such willful false statements may jeopardize the validity of the above-identified application or any patent issued thereon.

Date: _____

James M. Mori

Date: _____

James W. Thackeray

Date: _____

Roger F. Sinta

Date: _____

Rosemary Bell

Date: _____

Robin L. Miller-Fahey

Date: _____

Timothy G. Adams

Date: July 17, 2003

Thomas M. Zydowsky
Thomas M. Zydowsky

Date: _____

Edward K. Pavelchek

Mori et al.
U.S.S.N. 08726,613
Page 4

Date: _____

Manuel DoCanto

Exhibit 1

Notebook No. 2512.B

Continued From Page 21

P1

PROJECT

ESCAP dye

Prepare resists with dyes for lithography evaluations.
 Preparation: make up master batches of dyes and DTBPOCS.

2-Acetylphenothiazine: 0.1987 g
 ELEV: 19.4643 g
 % solids: 1.00%

Anthracaben: 0.2014 g
 ELEV: 20.2301 g
 % solids: 1.00%

Circumin: 36.20 g
 ELEV: 36.159 g
 % solids: 1.0%

animal/zebra use 5% sol's prepared
 on page 12 (PP2512B-12A)

DTBPOCS: 2.0900 g
 ELEV: 18.4528 g
 % solids 10.1%

ELEV lot # FT 876 DA
 DTBPOCS lot #: APR 19.24-1.7-

All measurements were made on balance model 12
 solutions were placed on the rollers for mixing at 3:30 AM

Solutions were removed from the rollers at 9:00 AM all are
 completely dissolved.

Make up resists with dyes to test lithography, absorbance.

R03512C-22A: 0% ANIMAL/HOMA

Poly-E (EEK-610), 3% DTBPOCS,

-22B: 2% 2-Acetylphenothiazine

0.2% TGAH, 0.3% PHASE

-22C: 2% Anthracaben

in ELEV @ 16% solids

-22D: 5% Circumin

-22E: No dye

Lot #: 3 used:

Poly-E KG-610 (solid)

TGAH: 100% solid prepared

DTBPOCS: APR 19.24-1.7- (10% solution)

by P. Hagerty

PHASE: 23552 FOI 2392 (10% solution)

Continued on Page 23

Read and Understood By

Dorothy Bell
Signed

Date

Alesia L. Allegan

Signed

Date

Exhibit 2

PROJECT ESCAP dyeNotebook No. 2510BContinued From Page 37

SEM Results cont'd

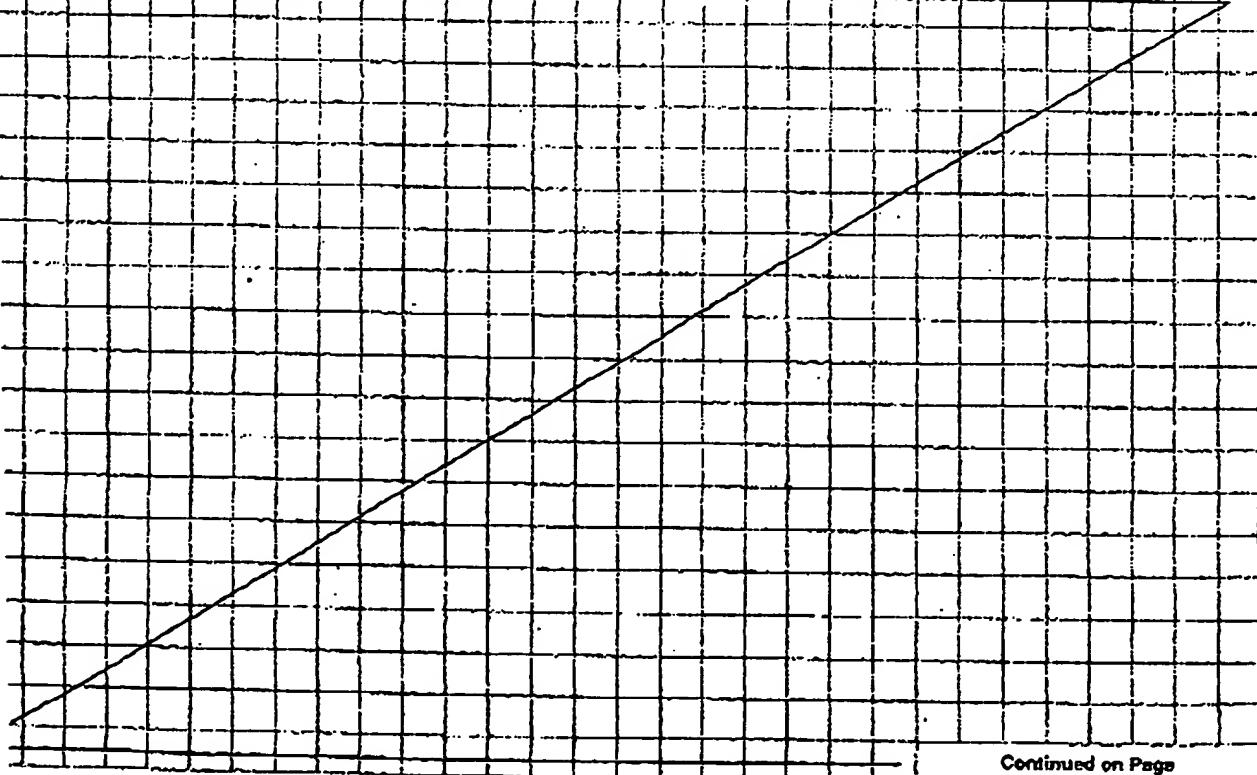
	Resolution, μm	Masking Linearity, μm	Focus Latitude		Exposure Latitude
			Optical, μm	Measured, μm	
XP-9549A	0.23	0.23	1.4	>1.0	±10.4%
with ANTMA/HEMA	0.23	0.23	1.2	1.4	±12.3%
with Acetylphenothiazine	0.24	0.20 0.24	1.0	>0.8	±10.5%
with Anthrarobin	0.23	0.23	1.2	1.6	±8.8%
with Curcumin	0.24	0.24	1.0	1.4	±7.9%

Total: Focus and Exposure Latitude were measured to ±10% CD change. (CD = 0.30μm)

RB2510-B pg 38

BB

Based on the above, the ANTMA/HEMA dye looks very promising. DOF is comparable to the control and the exposure latitude is better. Masking linearity for the dyed resist and control are the same.



Continued on Page

Read and Understood By

Rosemary Bell

Signed

Date

Sheri L. Alvega

Signed

Date



RECEIVED
JUL 25 2003
TC 1700

Docket No. 50184

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT(S): Mori et al. EXAMINER: J. Chu
U.S.S.N.: 08/726,613 GROUP: 1752
FILED: October 7, 1996
FOR: DYED PHOTORESISTS AND METHODS AND ARTICLES OF
MANUFACTURE COMPRISING SAME

Commissioner of Patents
P.O. Box 1450
Arlington, VA 22313-1450

DECLARATION UNDER 37 CFR 1.131

The undersigned declare as follows:

1. We are co-inventors of the above-identified application ("the application") assigned to the Shipley Company.

2. Prior to June 1996, we had conceived of, made and lithographically processed photoresist compositions that contained a photoacid generator, a resin binder and a polymer dyes that contained one or more polycyclic chromophores that could reduced undesired reflections of exposure radiation. We found that preferred chromophores were those that contained carbocyclic or heterocyclic polycyclic moieties, such as anthracene. We also found that preferred dye compounds were polymeric.

3. Prior to June 1996, one or more of us had coated such photoresist compositions onto substrates, particularly microelectronic (silicon) wafers, exposed the applied photoresist layers to activating radiation particularly radiation having a wavelength of 248 nm, and then the latent imaged formed in those photoresist layers were developed to provide a photoresist relief image by treating the exposed resist layers with an alkaline aqueous developer solution. As evidence thereof, attached as Exhibits 1 and 2 are true copies with dates deleted of notebook records of one of us. The disclosure attached as Exhibits 1 and 2 was generated, and actual experimental work disclosed therein was performed, prior to June 1996. Exhibit 1 shows that photoresists with dye compounds were prepared to test lithography. As shown in Exhibit 1, the prepared photoresists included a resin that was a copolymer of vinylphenol and t-butylacrylate (Poly-E), an onium salt photoacid generator of di-t-butylphenyliodonium camphorsulfonate, a basic stabilizer of a lactate salt of tetrabutyl ammonium hydroxide, solvent of ethyl lactate and a dye compound. The dye compounds of the prepared photoresists included ANTMA/HEMA which was a copolymer of methylanthracene methacrylate and hydroxyethyl methacrylate having a molecular weight in excess of 5,000 as disclosed in Example 1 of the application. Exhibit 2 shows lithography results of such photoresists with specified dye compounds, including a photoresist containing having the dye compound of an ANTMA/HEMA polymer.

Mori et al.
U.S.S.N. 08/726,613
Page 3

4. We hereby further declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, and that such willful false statements may jeopardize the validity of the above-identified application or any patent issued thereon.

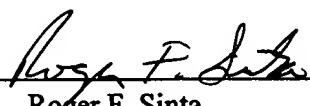
Date: _____

James M. Mori

Date: _____

James W. Thackeray

Date: July 17, 2003


Roger F. Sinta

Date: _____

Rosemary Bell

Date: _____

Robin L. Miller-Fahey

Date: _____

Timothy G. Adams

Date: _____

Thomas M. Zydowsky

Date: _____

Edward K. Pavelchek

Mori et al.
U.S.S.N. 08/726,613
Page 4

Date: _____

Manuel DoCanto

PROJECT ESCAP dye

PL

Prepare resists with dyes for lithographic evaluations.

Preparation: make up master batches of dyes and DTBPPOCS.

2-Acetylphenoxythiazine:	0.1987g	Anthracobin:	0.2014g
FLEX:	19.46643g	FLEX:	20.2304g
% solids:	1.00%	% solids:	1.00%

Curcumin:	36.30g	ANTIMALTEMA:	use 5% sol's prepared
FLEX:	36.159g	on page 12 (R02512B-12A)	
% solids:	1.0%		

DTBPPOCS:	2.0900g	FLEX LOT # FT 876 DA
FLEX:	18.4428g	DTBPPOCS LOT # ARC 1924-69-2
% solids	10.1%	

All measurements were made on balance MRAD 22.

Solutions were placed on the rollers for mixing at 3:20 pm.

Solutions were removed from the rollers at 9:00 am. All are completely dissolved.

Make up resists with dyes to test lithography, absorbance.

R02512B-22A:	0% ANMALTEMA	Poly-E (KE-610), 3% DTBPPOCS, 0.2% TBAH, 0.5% PHASE in FLEX @ 16% solids
-22B:	2% 2-Acetylphenoxythiazine	
-22C:	2% Anthracobin	
-22D:	5% Curcumin	
-22E:	No dye	

Lot #'s used:

Poly-E KE-610 (solid) TBAH: 10% soln prepared

DTBPPOCS: ARC 1924-69-2 (10% solution) by P. Hagey

PHASE: 23552F012892 (10% solution)

FLEX: FT 876 DA

Continued on Page 23

Read and Understood By

Rosemary Bell
Signed

Date

Sheri L. Almagro
Signed

Date

PROJECT ESCAP dye

Continued From Page 37

SEM Results cont'd

	Resolution, μm	Masking Linearity, μm	Focus Latitude		Exposure Latitude
			Optical, μm	Measured, μm	
XP-9549A with ANTMA/HEMA	0.23	0.23	1.4	>1.0	±10.4%
	0.23	0.23	1.2	1.4	±12.3%
	0.24	0.20 0.24	1.0	>0.8	±10.5%
	0.23	0.23	1.2	1.6	±8.8%
	0.24	0.24	1.0	1.4	±7.9%

Note: Focus and Exposure Latitude were measured to ±10% CD change. (CD = 0.30μm)

RB 2512B
pg 38

Based on the above, the ANTMA/HEMA dye looks very promising. DOF is comparable to the control and the exposure latitude is better. Masking linearity for the dyed resist and control are the same.

Continued on Page

Read and Understood By

Rosemary Bell

Signed

Date

Sheri L. Mingo

Signed

Date



RECEIVED
JUL 25 2003
TC 1700

Docket No. 50184

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT(S): Mori et al.

EXAMINER: J. Chu

U.S.S.N.: 08/726,613

GROUP: 1752

FILED: October 7, 1996

FOR: DYED PHOTORESISTS AND METHODS AND ARTICLES OF
MANUFACTURE COMPRISING SAME

Commissioner of Patents
P.O. Box 1450
Arlington, VA 22313-1450

DECLARATION UNDER 37 CFR 1.131

The undersigned declare as follows:

1. We are co-inventors of the above-identified application ("the application") assigned to the Shipley Company.

2. Prior to June 1996, we had conceived of, made and lithographically processed photoresist compositions that contained a photoacid generator, a resin binder and a polymer dyes that contained one or more polycyclic chromophores that could reduced undesired reflections of exposure radiation. We found that preferred chromophores were those that contained carbocyclic or heterocyclic polycyclic moieties, such as anthracene. We also found that preferred dye compounds were polymeric.

3. Prior to June 1996, one or more of us had coated such photoresist compositions onto substrates, particularly microelectronic (silicon) wafers, exposed the applied photoresist layers to activating radiation particularly radiation having a wavelength of 248 nm, and then the latent imaged formed in those photoresist layers were developed to provide a photoresist relief image by treating the exposed resist layers with an alkaline aqueous developer solution. As evidence thereof, attached as Exhibits 1 and 2 are true copies with dates deleted of notebook records of one of us. The disclosure attached as Exhibits 1 and 2 was generated, and actual experimental work disclosed therein was performed, prior to June 1996. Exhibit 1 shows that photoresists with dye compounds were prepared to test lithography. As shown in Exhibit 1, the prepared photoresists included a resin that was a copolymer of vinylphenol and t-butylacrylate (Poly-E), an onium salt photoacid generator of di-t-butylphenyliodonium camphorsulfonate, a basic stabilizer of a lactate salt of tetrabutyl ammonium hydroxide, solvent of ethyl lactate and a dye compound. The dye compounds of the prepared photoresists included ANTMA/HEMA which was a copolymer of methylanthracene methacrylate and hydroxyethyl methacrylate having a molecular weight in excess of 5,000 as disclosed in Example 1 of the application. Exhibit 2 shows lithography results of such photoresists with specified dye compounds, including a photoresist containing having the dye compound of an ANTMA/HEMA polymer.

Mori et al.
U.S.S.N. 08/726,613
Page 3

4. We hereby further declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, and that such willful false statements may jeopardize the validity of the above-identified application or any patent issued thereon.

Date: 7/16/2003

James M. Mori
James M. Mori

Date: 7/16/03

James W. Thackeray
James W. Thackeray

Date: _____

Roger F. Sinta
Roger F. Sinta

Date: 7/16/03

Rosemary Bell
Rosemary Bell

Date: 7/16/03

Robin L. Miller-Fahey
Robin L. Miller-Fahey

Date: 7/16/03

Timothy G. Adams
Timothy G. Adams

Date: _____

Thomas M. Zydowsky
Edward K. Pavelchek
Edward K. Pavelchek

Date: 7/17/03

Mori et al.
U.S.S.N. 08/726,613
Page 4

Date: _____

Manuel DoCanto

PROJECT ESCAP dye

Prepare resists with dyes for lithographic evaluations.

Preparation: make up master batches of dyes and DTBPOCS

2-Acetylphenothiazine: 0.1987 g

FLEX: 19.6643 g

% solids: 1.00%

Anthracobin: 0.2044 g

FLEX: 20.2304 g

% solids: 1.00%

Curcumin: 3.630 g

FLEX: 34.159 g

% solids: 1.04%

ANTMA/HEMA: use 5% sol'n prepared

on page 12 (RB2512B-12A)

DTBPOCS: 2.0900 g

FLEX: 18.6428 g

% solids +0.1% 10.1%

FLEX LOT # ET 876 DA

DTBPOCS LOT # ARC 1924-69-2

All measurements were made on balance M.R.#D 22.

Solutions were placed on the rollers for mixing at 3:20 pm

Solutions were removed from the rollers at 9:00 am all are completely dissolved.

Make up resists with dyes to test lithography, absorbance.

RB2512B-22A: 2% ANTMALHEMA

-22B: 2% 2-Acetylphenothiazine

-22C: 2% Anthracobin

-22D: 5% Curcumin

-22E: No dye

Poly-E (KE-610), 3% DTBPOCS,

0.2% TBAH, 0.5% PHASE

in FLEX @ 16% solids

Lot #'s used:

Poly E KE-610 (solid)

TBAH: 10% sol'n prepared

DTBPOCS: ARC 1924-69-2 (10% solution)

by P. Hagerty

PHASE: 23552FC12892 (10% solution)

Continued on Page 23

FLEX: ET 876 DA

Read and Understood By

Rosemary Bell
Signed

Date

Sheri L. Almagro
Signed

Date

PROJECT ESCAP dyeSEM Results cont'd

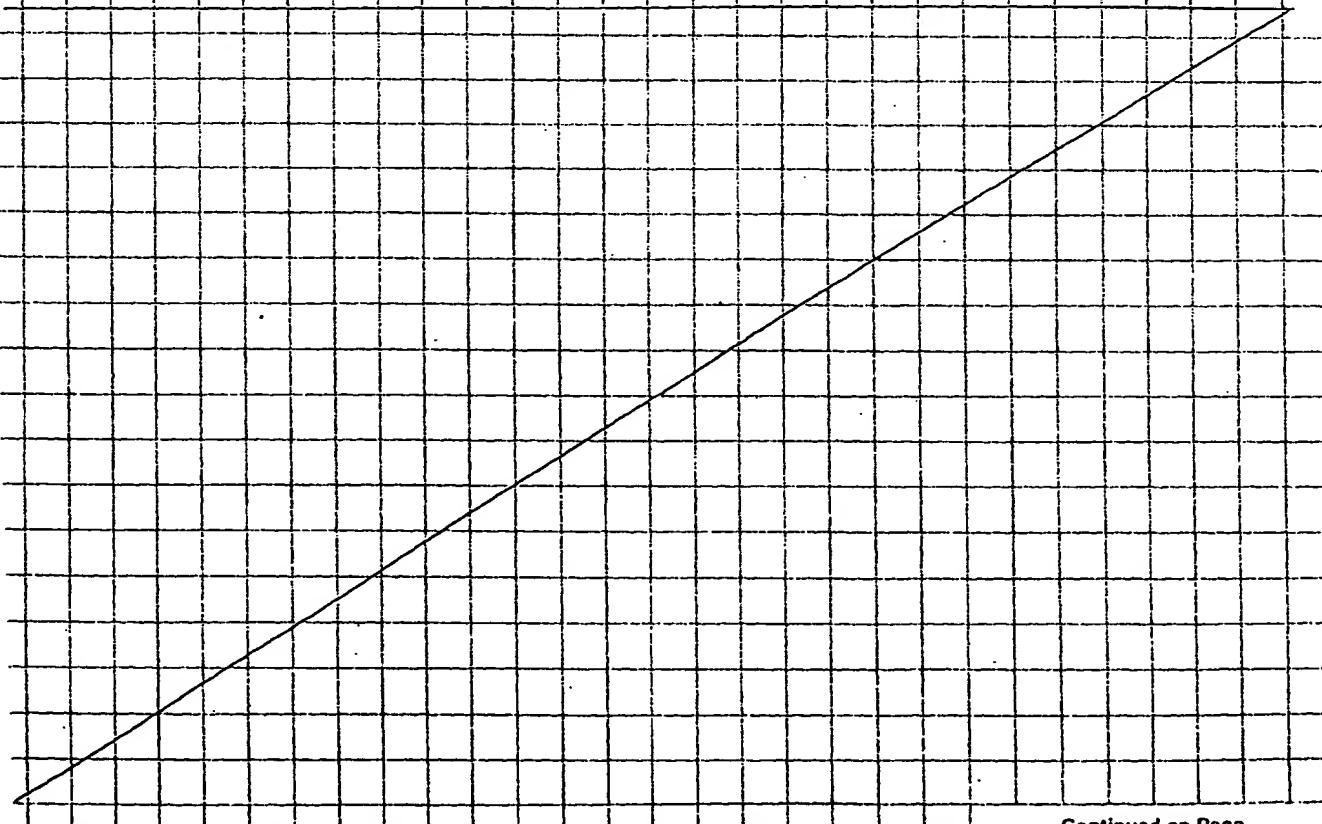
	Resolution, μm	Masking Linearity, μm	Focus Latitude		Exposure Latitude
			Optical, μm	Measured, μm	
XP-9549A	0.23	0.23	1.4	>1.0	±10.4%
	0.23	0.23	1.2	1.4	±12.3%
	0.24	0.20 0.24	1.0	>0.8	±10.5%
	0.23	0.23	1.2	1.6	±8.8%
	0.24	0.24	1.0	1.4	±7.9%

Note: Focus and Exposure Latitude were measured to ±10% CD change. (CD = 0.30μm)

RB2512-B
pg 38

BB

Based on the above, the ANTMA/HEMA dye looks very promising. DOF is comparable to the control and the exposure latitude is better. Masking linearity for the dyed resist and control are the same.



Continued on Page

Read and Understood By

Rosemary Bell

Signed

Date

Sheri L. Moyer

Signed

Date



RECEIVE

JUL 25 2003

TC 1700

Docket No. 50184

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT(S): Mori et al.

EXAMINER: J. Chu

U.S.S.N.: 08/726,613

GROUP: 1752

FILED: October 7, 1996

FOR: DYED PHOTORESISTS AND METHODS AND ARTICLES OF
MANUFACTURE COMPRISING SAME

Commissioner of Patents
P.O. Box 1450
Arlington, VA 22313-1450

DECLARATION

I, Peter Corless, declare as follows:

1. I am an attorney of record of the above-identified application ("the application"), which has been assigned by all the inventors to the Shipley Company. A copy of the recorded Assignment for the application is attached.

2. I have been informed that named inventor Manuel DoCanto is no longer employed by the Shipley Company. I sent by overnight mail to the known residence address of Manuel DoCanto a Declaration under 37 CFR 1.131 for Mr. DoCanto's review and signature. That overnight mail included an envelope with postage pre-paid for the signed Declaration to be returned to me by overnight service. I have not yet received the signed Declaration from Mr. DoCanto, or any other communication from Mr. DoCanto regarding the Declaration. I also have been informed by administration personnel of the Shipley Company that I should not expect to receive the signed Declaration from Mr. DoCanto.

3. I declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, and that such willful false statements may jeopardize the validity of the above-identified application or any patent issued thereon.

Date: July 21, 2003


Peter F. Corless

MAYA BENNETT, EXAMINER
ASSIGNMENT DIVISION
OFFICE OF PUBLIC RECORDS

O I P E
RECEIVED
JUL 23 2003

12-23-1996

Docket No. 50184

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

08/726613

100328157

SHEET

tached original documents or copy thereof.

1. Name of conveying party(ies): James Michael Mori
 James W. Thackeray Timothy G. Adams
 Roger F. Sinta Thomas M. Zydowsky
 Rosemary Bell Edward K. Pavelchek
 Robin L. Miller-Fahey Manuel doCanto
 Additional name(s) of conveying party(ies) attached? Yes No

2. Name and address of receiving party(ies)

Name: Shipley Company, L.L.C.

Internal Address:

RECEIVED
JUL 25 2003
TC 1700Street Address: 455 Forest StreetCity: Marlborough State: MA ZIP: 01752Additional name(s) & address(es) attached? Yes No

3. Nature of conveyance:

Assignment Merger
 Security Agreement Change of Name
 Other _____

Execution Date: 9/26/96, 9/27/96, 10/1-4/96

4. Application number(s) or patent number(s):

If this document is being filed together with a new application, the execution date of the application is: 9/26/96, 9/27/96,
10/1-4/96

A. Patent Application No.(s)

B. Patent No.(s)

11100 U.S. PTO

Additional numbers attached? Yes No

12/19/96

5. Name and address of party to whom correspondence concerning document should be mailed:

6. Total number of applications and patents involved: 1Name: Robert L. Goldberg, Esq.7. Total fee (37 CFR 3.41).....\$ 40.00

Internal Address: _____

 EnclosedStreet Address: P.O. Box 556 Authorized to be charged to deposit accountCity: Marlborough State: MA ZIP: 01752

8. Deposit account number:

(Attach duplicate copy of this page if paying by deposit account)

DO NOT USE THIS SPACE

9. Statement and signature.

To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document.

Robert L. Goldberg

Name of Person Signing

Signature

October 7, 1996

Date

5

Total number of pages including cover sheet, attachments, and document:

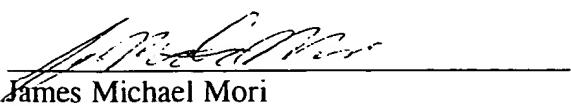
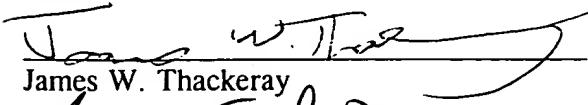
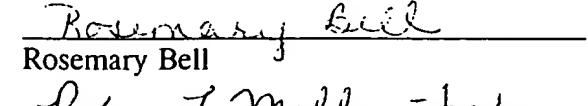
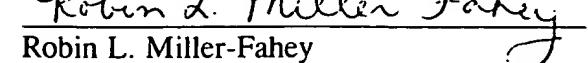
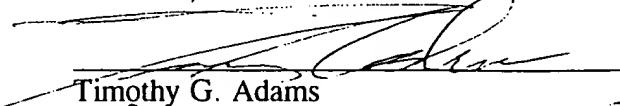
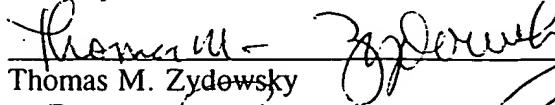
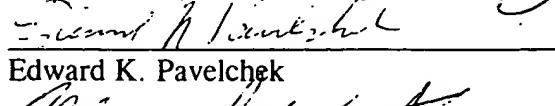
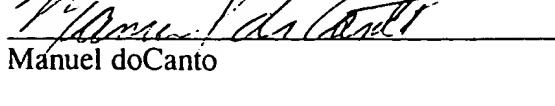
ASSIGNMENT

We, James Michael Mori of Dorchester, Massachusetts, James W. Thackeray of Braintree, Massachusetts, Roger F. Sinta of Woburn, Massachusetts, Rosemary Bell of Wayland, Massachusetts, Robin L. Miller-Fahey of Marlborough, Massachusetts, Timothy G. Adams of Sudbury, Massachusetts, Thomas M. Zydowsky of Cambridge, Massachusetts, Edward K. Pavelchek of Stow Massachusetts and Manuel doCanto of Stoughton, Massachusetts, for good and valuable consideration from Shipley Company, L.L.C., a Limited Liability Company of Delaware, having its principal place of business in Marlborough, Massachusetts, hereinafter called the Assignee, receipt of which is hereby acknowledged, do hereby sell, assign and transfer unto the Assignee, its successors and assigns, the entire right, title and interest in, to and under an application for Letters Patent of the United States, attached hereto and executed by us on the dates indicated below for Improvements in "DYED PHOTORESISTS AND METHODS AND ARTICLES OF MANUFACTURE COMPRISING SAME," and the inventions and any of them therein set forth and described, and any and all Letters Patent of the United States and of countries foreign thereto which may be granted thereon or therefor;

And for the above consideration we agree promptly upon request of the Assignee, its successors or assigns, to execute and deliver without further compensation any power of attorney, assignment, application, whether original, divisional, continuation or reissue, or other papers which may be necessary or desirable fully to secure to the Assignee, its successors and assigns, the inventions and any of them described in said application and all patent rights therein, in the United States and in any country foreign thereto.

IN WITNESS WHEREOF,

I, James Michael Mori, hereunto set my hand and seal this 26 day of September, 1996,
I, James W. Thackeray, hereunto set my hand and seal this 2 day of October, 1996,
I, Roger F. Sinta, hereunto set my hand and seal this 1 day of October, 1996,
I, Rosemary Bell, hereunto set my hand and seal this 27 day of September, 1996,
I, Robin L. Miller-Fahey, hereunto set my hand and seal this 2 day of October, 1996,
I, Timothy G. Adams, hereunto set my hand and seal this 27 day of September, 1996,
I, Thomas M. Zydowsky, hereunto set my hand and seal this 27 day of September, 1996,
I, Edward K. Pavelchek, hereunto set my hand and seal this 3 day of October, 1996,
and I, Manuel doCanto, hereunto set my hand and seal this 4 day of October, 1996.


James Michael Mori
James W. Thackeray
Roger F. Sinta
Rosemary Bell
Robin L. Miller-Fahey
Timothy G. Adams
Thomas M. Zydowsky
Edward K. Pavelchek
Manuel doCanto

Commonwealth of Massachusetts

ss.

County of Middlesex

Before me this 26th day of September, 1996, personally appeared James Michael Mori, who is to me personally known, and acknowledged the foregoing instrument of assignment to be his free act and deed.

Theresa M. Falcone
Notary Public
My Commission Expires: 8/25/2000

Commonwealth of Massachusetts

ss.

County of Middlesex

Before me this 2nd day of October, 1996, personally appeared James W. Thackeray, who is to me personally known, and acknowledged the foregoing instrument of assignment to be his free act and deed.

Theresa M. Falcone
Notary Public
My Commission Expires: 8/25/2000

Commonwealth of Massachusetts

ss.

County of Middlesex

Before me this 1st day of October, 1996, personally appeared Roger F. Sinta, who is to me personally known, and acknowledged the foregoing instrument of assignment to be his free act and deed.

Theresa M. Falcone
Notary Public
My Commission Expires: 8/25/2000

Commonwealth of Massachusetts

ss.

County of Middlesex

Before me this 27th day of September, 1996, personally appeared Rosemary Bell, who is to me personally known, and acknowledged the foregoing instrument of assignment to be his free act and deed.

Theresa J. Falcone
Notary Public
My Commission Expires: 8/25/2000

Commonwealth of Massachusetts

ss.

County of Middlesex

Before me this 2nd day of October, 1996, personally appeared Robin L. Miller-Fahey, who is to me personally known, and acknowledged the foregoing instrument of assignment to be his free act and deed.

Theresa J. Falcone
Notary Public
My Commission Expires: 8/25/2000

Commonwealth of Massachusetts

ss.

County of Middlesex

Before me this 27th day of September, 1996, personally appeared Timothy G. Adams, who is to me personally known, and acknowledged the foregoing instrument of assignment to be his free act and deed.

Theresa J. Falcone
Notary Public
My Commission Expires: 8/25/2000

Commonwealth of Massachusetts

ss.

County of Middlesex

Before me this 27th day of September, 1996, personally appeared Thomas M. Zydowsky, who is to me personally known, and acknowledged the foregoing instrument of assignment to be his free act and deed.

Theresa St. Falcone
Notary Public
My Commission Expires: 8/25/2000

Commonwealth of Massachusetts

ss.

County of Middlesex

Before me this 3rd day of October, 1996, personally appeared Edward K. Pavelchek, who is to me personally known, and acknowledged the foregoing instrument of assignment to be his free act and deed.

Theresa St. Falcone
Notary Public
My Commission Expires: 8/25/2000

Commonwealth of Massachusetts

ss.

County of Middlesex

Before me this 4th day of October, 1996, personally appeared Manuel doCanto, who is to me personally known, and acknowledged the foregoing instrument of assignment to be his free act and deed.

Theresa St. Falcone
Notary Public
My Commission Expires: 8/25/2000